

REMARKS/ARGUMENTS

In the Office Action mailed October 3, 2008, claims 1-15 and 17-25 were rejected. In response, Applicant hereby requests reconsideration of the application in view of the below-provided remarks. No claims are added or canceled.

For reference, claim 8 is amended. In particular, claim 8 is amended to correct a grammatical error. This amendment is supported by the original language of the claims.

Claim Rejections under 35 U.S.C. 112

Claims 1-15 and 17-25 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Office Action states that it is not clear whether the first write data would ever be stored in the register. However, the Office Action fails to establish a basis for this rejection because the Office Action fails to analyze the claim according to accepted standards of review.

Definiteness of a claim must be analyzed in light of 1) the content of the application, 2) the teachings of the prior art, and 3) a reasonable claim interpretation. MPEP 2173.02. In reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of the scope of the claim and, therefore, serves the notice function by providing clear warning to others as to what constitutes infringement of the claim. Id. Accordingly, a claim is not indefinite if the meaning of the claim is discernible. Id. Moreover, the examiner should allow claims which define the patentable subject matter with a reasonable degree of particularity and distinctness. Id.

In the present Office Action, the rejection under 35 U.S.C. 112 fails to analyze the language of the claims in light of the content of the present application. In other words, the Office Action does not attempt to understand the meaning and scope of the claims in light of the subject matter described in the specification of the present application. The rejection also fails to provide analysis of the language of the claims in light of the teachings of the prior art. In other words, the Office Action does not attempt to

understand the meaning and scope of the claims in light of the subject matter available in the prior art, generally. The rejection also fails to provide analysis of the language of the claims in light of a reasonable claim interpretation, because the Office Action does not attempt to construe the limitations of the claims. Therefore, the Office Action does not analyze the definiteness of the claims in light of the standards set forth in the MPEP. For at least this reason, Applicant respectfully requests that the rejections under 35 U.S.C. 112, second paragraph, are improper because the Office Action does not analyze the definiteness of the claims in light of the content of the present application, the teachings of the prior art, or a reasonable interpretation of the claims.

Moreover, the Office Action appears to focus the analysis on what is not said in the claims, rather than on the actual language of the claims. In particular, the Office Action attempts to construe various hypothetical scenarios of what might happen, under limited conditions. However, the Office Action does not provide a detailed analysis of the actual language of the claims, as a whole, to evaluate whether the actual language provides a reasonable degree of particularity and distinctness so as to serve the notice function by providing clear warning to others for what would constitute infringement of the claim. In other words, the Office Action appears to lack a substantive analysis of the actual language of the claim, despite providing a careful, but nevertheless irrelevant, analysis of hypothetical scenarios that are not necessarily within the scope of the subject matter recited in the claims.

For example, the Office Action focuses the analysis on whether the first write data would ever be stored in the register. However, the Office Action fails to recognize that the recited write operation may write the first write data or the second write data from the register to the memory. Thus, the language of the claim does not imply or require that the first write data must be stored in the register, even though in some situations it may be useful to do so. In some scenarios, the first write data may be stored in the register and written from the register to the memory. However, in other scenarios, the second write data may be written from the register to the memory, without any requirement from the language of the claims that the first write data must be stored in the register.

Although the Office Action offers a detailed analysis of various hypothetical scenarios, the Office Action nevertheless fails to support the stated rejection because the

Office Action does not address the actual language of the claims. Therefore, the Office Action does not satisfy the requirements to properly determine whether the claim apprises one of ordinary skill in the art of the scope of the claim. Accordingly, Applicant respectfully requests that the rejections of claims 1-15 and 17-25 under 35 U.S.C. 112, second paragraph, be withdrawn.

Claim Rejections under 35 U.S.C. 102 and 103

Claims 1-5, 9-14, 17-20, 24, and 25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Norman (U.S. Pat. No. 6,438,665, hereinafter Norman) in view of Magro (U.S. Pat. No. 6,151,658, hereinafter Magro). Additionally, claims 6-8 and 21-23 were rejected under 35 U.S.C. 103(a) as being unpatentable over Norman in view of Magro and further in view of Reams (U.S. Pat. No. 6,438,660, hereinafter Reams). Additionally, claim 15 was rejected under 35 U.S.C. 103(a) as being unpatentable over Norman in view of Magro and further in view of Sunaga et al. (U.S. Pat. No. 6,785,154, hereinafter Sunaga). However, Applicant respectfully submits that these claims are patentable over Norman, Margo, Reams, and Sunaga for the reasons provided below.

Independent Claim 1

Claim 1 recites “ascertain whether said first address information is stored in said register” and “if yes, compare said first write data with second write data of an earlier write request in said register allocated to said first address information to determine if said first write data is different from said second write data, and forward said first write data to said register in response to a determination that said first write data is different from said second write data” (emphasis added).

For a proper understanding of this subject matter in the claim, it should be noted that the comparison is between first write data and second write data. The write data is different from corresponding write addresses, or address information. The first write data is received as part of a write request. In contrast, the second write data is from a previous write request—prior to the write request which includes the first write data. The second write data is stored in the register, which is a temporary storage. Since there is a cost associated with writing data to memory, the register can be used to temporarily store the

second write data and, perhaps, the first write data before the first or second write data is written to the memory or, alternatively, discarded. As explained in the specification of the present application, in certain embodiments the first write data is written from the register to the memory only if the first write data is different from data already stored in the memory at the address corresponding to the first write address information. Page 4, lines 9-14. While the details of the specification are not read into the claims, this general overview of the subject matter described in the specification should be useful to provide a contextual example of the terminology and language in the claim.

Furthermore, it should be noted that the language of the claim should be viewed as a whole. Thus, the language related to comparing the first write data with the second write data in the register to determine if the first write data is different from the second write data should be understood as a single type of comparison. This language should not be separated into two distinct phrases that, when considered independently, do not convey the meaning of the language as a whole.

In the present Office Action, the rejection is presented as though the comparing and determining language might refer to separate actions. In particular, the Office Action refers to Norman as purportedly teaching determining if first and second write data are different, but the Office Action fails to recognize that Norman does not teach comparing first write data with second write data in a register. Separately, the Office Action refers to Magro as purportedly teaching comparing first and second write data in a register. However, Magro does not teach comparing first and second write data in a register to determine if the first and second write data are different. As explained in Applicant's previous response (and reproduced below), Magro merely describes determining which bits are valid, but Magro does not determine if the content of the first and second write data are different.

Thus, although Norman may describe comparing first and second write data in memory, and Magro may describe determining which bits might be valid between first and second write data, these separate descriptions do not coincide to teach the language of the claim, as a whole. Rather, the proposed combination of teachings of Norman and Magro would, at best, describe comparing first and second write data in memory (as taught in Norman), and not in a register, to determine which bits might be valid and either

merged or overwritten. Alternatively, the proposed combination would merely address determining which bits are valid between first and second write data, without comparing the first and second write data in the register to determine if the first and second write data are actually different. In either case, the comparison of Norman involves data that is already in memory, so there is no need to perform the comparison in order to determine whether or not the data is different and, ultimately, whether or not to write the data to memory, since the data is already in the memory. Therefore, the proposed combination of references is insufficient to teach the language of the claim, as a whole, because the proposed combination attempts to split one cohesive concept into two disparate pieces and separately address each piece.

Ultimately, the Office Action simply does not address comparing first write data with second write data in a register to determine if the first and second write data are different. Although Norman describes a type of comparison, Norman merely describes a process of comparing data that is already in memory. Separately, Magro merely describes determining which bits might be valid, without performing a comparison to determine if the data is the same or different. Thus, the combination of Magro and Norman would merely suggest a system which determines valid bits and then compares data that is already in the memory. However, this combination fails to address performing a comparison of first write data with second write data in a register to determine if the first and second write data are different, as recited in the language of the claim, as a whole.

For convenience, Applicant's previous remarks are presented herein to explain, again, that the combination of Norman and Magro does not teach all of the limitations of the claim. As stated previously, the Office Action acknowledges Norman does not teach ascertaining whether a first address information is stored in the register and, if yes, comparing the first write data with second write data of an earlier write request in the register, as recited in the claim. Hence, the Office Action relies on Magro as purportedly teaching the indicated limitations. However, Magro fails to teach the indicated limitations. In particular, Magro does not teach comparing the first write data with second write data of an earlier write request in the register. Additionally, even if Magro

were to teach such a comparison, Magro does not teach using such comparison results to influence or determine how the write data is written to the data store.

1. Magro does not teach comparing first write data with second write data of an earlier write request in the register.

Magro is directed to a system with a write buffer to provide random access snooping capability. Magro, abstract. More specifically, Magro describes a random access memory (RAM) 80 with a content addressable memory (CAM) address store 68 and a RAM data store 70. Magro, Fig. 2. A producer provides the address store with an input write address and provides the data store with input write data. The CAM compares the input write address to the addresses in the address store to determine if the input write address is “related” to an address present in the address store. If the input address is related to an address in the address store, then the input write data is stored in the rank of the data store associated with the related address in the address store. Magro, col. 2, lines 20-37.

Magro describes two ways to store the input write data in the data store. For input write data that does not overlap with the data already stored in the rank of the data store, a write merging operation merges the input write data with the existing write data in the data store. Magro, col. 2, lines 37-40. An example of write merging is explained in relation to Fig. 3E, in which the input write data ‘---52cc’ is merged with the existing write data ‘a369----’ to produce write data ‘a36952cc’ in the data store. Magro, col. 10, lines 19-23. For input write data that overlaps with the data already stored in the rank of the data store, a write collapse operation overwrites the corresponding write data in the data store using the input write data. Magro, col. 2, lines 40-43; col. 12, lines 34-37. An example of write collapsing is explained in relation to Fig. 4E, in which the input write data ‘---52cc’ partially overwrites the existing write data ‘a36941ff’ to produce write data ‘a36952cc’ in the data store (i.e., the ‘41ff’ portion of the existing write data is overwritten by the input write data ‘52cc’). Magro, col. 12, lines 16-25.

Although Magro describes write merging and write collapsing to place the input write data in the data store, Magro does not describe comparing the input write data with the existing write data already in the data store. Rather, Magro merely describes using

valid bits to indicate whether the existing write data is valid. Magro, col. 12, lines 20-37. In the examples referred to above, the invalid write data designated by dashes ‘----’ would not have the corresponding valid bits set, while the valid write data would have the corresponding valid bits set. However, the valid bits are not used for any type of comparison between the input write data and the existing write data already in the data store. Thus, even if Magro were to describe ascertaining whether an input write address is stored in the address store, Magro nevertheless does not describe comparing the input write data with the existing write data already in the data store.

Moreover, the write merging and write collapsing described in Magro does not inherently teach comparing the input write data with the existing write data already in the data store. As indicated above, Magro merely indicates using valid bits to designate whether or not the data store includes existing data. While Magro describes two types of writing operations, there is no difference between these two types of writing operations which would support the assertion of an inherent comparison. Regardless of whether the writing operation is considered a write merging operation or a write collapsing operation, the described functionality merely writes the new data to the corresponding locations within the memory store, without any type of comparison.

2. Magro does not teach using comparison results to determine how write data is written to a data store.

Moreover, within the context of Magro, there would be no reason to implement a comparison because there is no need for the results of such a comparison. Additionally, there is no explanation or reasoning to show how such comparison results might be used to influence or determine how the write data is written to the data store. Although the Advisory Action attempts to argue that a comparison would be inherent in determining whether to implement a write merging or a write collapsing operation, the teachings of Magro are insufficient to support this assertion because the determination of whether to use write merging or write collapsing can be made without a comparison. For example, as explained in Applicant’s previous response, the write merging and collapsing operations can be implemented simply by determining which bits are valid within each location in the data store, without regard for the actual content in each location. Hence,

the determination of whether to use write merging or write collapsing merely depends on which data store locations have existing valid data and which data store locations do not have existing valid data. However, determining whether data locations have existing valid data does not inherently require the use of a comparison to compare data stored in each location with data to be written to certain locations. In other words, the write merging and write collapsing operations can be implemented without performing the type of comparison recited in the claim of the present application. Thus, the comparison is not an inherent part of the write merging and collapsing operations because the write merging and collapsing operations do not explicitly or necessarily require such comparison.

Therefore, the combination of Norman and Magro does not teach all of the limitations of the claim because Magro does not teach comparing first write data with second write data of an earlier write request in the register, or the other limitations recited in the claim, as a whole. Accordingly, Applicant respectfully asserts claim 1 is patentable over the combination of Norman and Magro because the combination of Norman and Magro does not teach all of the limitations of the claim.

Independent Claim 17

Applicant respectfully asserts independent claim 17 is patentable over the combination of Norman and Magro at least for similar reasons to those stated above in regard to the rejection of independent claim 1. In particular, claim 17 recites “ascertaining whether said first address information is stored in said writing queue” and “if yes, comparing said first write data with second write data in said writing queue allocated to said first address information to determine if said first write data is different from said second write data, and forwarding said first write data to said writing queue in response to a determination that said first write data is different from said second write data” (emphasis added).

Here, although the language of claim 17 differs from the language of claim 1, and the scope of claim 17 should be interpreted independently of claim 1, Applicant respectfully asserts that the remarks provided above in regard to the rejection of claim 1 also apply to the rejection of claim 17. Accordingly, Applicant respectfully asserts claim 17 is patentable over the combination of Norman and Magro because the combination of

Norman and Magro does not teach comparing first write data with second write data of an earlier write request in the register, or the other limitations recited in the claim.

Dependent Claims

Claims 2-15 and 18-25 depend from and incorporate all of the limitations of the corresponding independent claims 1 and 17. Applicant respectfully asserts claims 2-15 and 18-25 are allowable based on allowable base claims. Additionally, each of claims 2-15 and 18-25 may be allowable for further reasons.

CONCLUSION

Applicant respectfully requests reconsideration of the claims in view of the remarks made herein. A notice of allowance is earnestly solicited.

At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account **50-3444** pursuant to 37 C.F.R. 1.25. Additionally, please charge any fees to Deposit Account **50-3444** under 37 C.F.R. 1.16, 1.17, 1.19, 1.20 and 1.21.

Respectfully submitted,

/mark a. wilson/

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Mark A. Wilson
Reg. No. 43,994

Wilson & Ham
PMB: 348
2530 Berryessa Road
San Jose, CA 95132
Phone: (925) 249-1300
Fax: (925) 249-0111